HDMI 4x1 Selection Switcher User Guide

Model CM-SW4110-HD

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Content

Important information...ii
Limitation of liability...ii

Introduction...1
Features...1
Package contents...1

Specifications...2

Operation of the control panel and remote controller...3
Operation of control panel...3
Operation of the remote controller...4

Interface connections...4
Connection with the control system...4
Connection with the computer...5

System diagram...6

Auto-switching function...6

Panel drawing...8

Communication protocol and command codes...9

Troubleshooting and maintenance...10

Safety operation...11

After-sales service...12

Important information

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Introduction

Use the HDMI 4x1 selection switcher to allow multiple HDMI source devices to be routed to a single, available HDMI input on a display. This can reduce the number of HDMI cables required to run to the display. The switch can be controlled using the front panel buttons, IR remote (included), or RS232 control.

The switch is a high performance HDMI device supporting resolutions up to 1920 x 1200 at 60 Hz, and 1080p. It supports EDID and DDC, and is HDCP and HDTV compliant. It can be used in both residential and commercial applications to allow a single available HDMI to view a variety of sources.

Features

- Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC)
- HDTV compatible with high definition transmission resolution up to 1920 x 1200 at 60 Hz (maximum), and 1080p.
- HDCP compliant, supporting DVI/HDMI 1.4a
- Built-in gain compensation technology
- Switching control from the front panel, RS232, and the IR remote

Package contents

- 1 x CM-SW4110-HD 4x1 HDMI selection switch
- 2 x removable mounting brackets
- 4 x screws
- 1 x IR remote control
- 1 x power adapter (5 VDC)
- 1 x RS232 cable
- 1 x user manual

Notes: Please verify that the product and all the accessories are included. If not, contact your dealer.

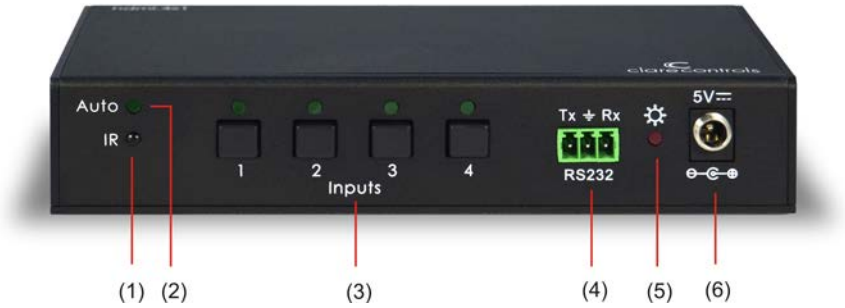
Specifications

Video Input		**Video Output**	
Input	HDMI type	Output type	HDMI
Input connector	Female HDMI	Output connector	Female HDMI
Input level	T.M.D.S. 2.9 V / 3.3 V	Output level	T.M.D.S. 2.9 V / 3.3 V
Input impedance	50Ω	Output impedance	50Ω
General			
Resolution range	Up to 1920 × 1200 or 1080P at 60 Hz	Bandwidth	6.75 Gb/s
Switching speed	200 ns (maximum)	Input / Output level	T.M.D.S. 2.9V / 3.3 V
Gain	0 dB	Video impedance	50Ω
EDID / DDC	Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data using DVI and HDMI standards, EDID and DDC signals are actively buffered. The built-in EDID/DDC database can analyze these two signals, mix them, and realize the handshake of them internally.		
HDCP	Compliant with High-bandwidth Digital Content Protection (HDCP) using DVI and HDMI 1.4a standards. The built-in HDCP management technology can analyze HDCP key, and realize the handshake internally.		
Control parts			
Control/Remote	Buttons; RS-232 (9-pin female D connector), IR remote	Pin configurations	2 = TX 3 = RX 5 = GND
General			
Temperature	-4 to 158°F (-20 to 70°C)	Humidity	10% to 90%
Power supply	5 VDC adapter	Product Weight	.66 lb. (0.3 Kg)
Power consumption	10 W	Case dimension (W × H × D)	6.10 × 1.18 × 3.15 in. (15.5 × 3.0 × 8.0 cm)

Operation of the control panel and remote controller

Operation of control panel

Figure 1: HDMI 4x1 selection switcher



(1) IR	Infrared remote controller
(2) Auto-sw	Switching modes status indicator
(3) INPUT	HDMI input channels, from 1 to 4
(4) RS232	RS232 control port
(5) Gear	Power indicator light
(6) Power	Power supply connection

Note: When selecting any one of the four input channels, press the corresponding key on the front panel. Pressing and holding the front key **INPUT1** for three seconds triggers the switcher to start or stop running in auto-switching or manual-switching mode.

Operation of the remote controller

Figure 2: Remote controller

When select any one of the four input channels, press the corresponding key on the remote controller. Pressing and holding the key 1 for 3 seconds triggers the switcher to start or stop running in auto-switching or manual-switching mode.

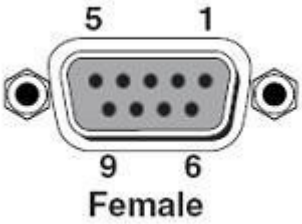
Interface connections

Connection with the control system

You can perform control functions via a control system (Clare Controls, Crestron, or other system.) using its RS232 communication port. The RS232 communication port is a female 9-pin D connector (DB9). As shown in the table below, only pins 2, 3, and 5 are used. The standard functions of Tx, Rx, and Gnd apply.

Table 1: RS232 connection definitions

No.	Pin	Function
1	N/u	Unused
2	Tx	Transmit
3	Rx	Receive
4	N/u	Unused
5	Gnd	Ground
6	N/u	Unused
7	N/u	Unused
8	N/u	Unused
9	N/u	Unused



Connection with the computer

To connect the switcher to a computer:

1. Use the DB9 cable (included) to connect the RS232 control port to a control system or computer.

   The adapter cable is pinned as follows:

   Pin 1: Connects to the 2 pin of the male 9-pin connector (Tx).

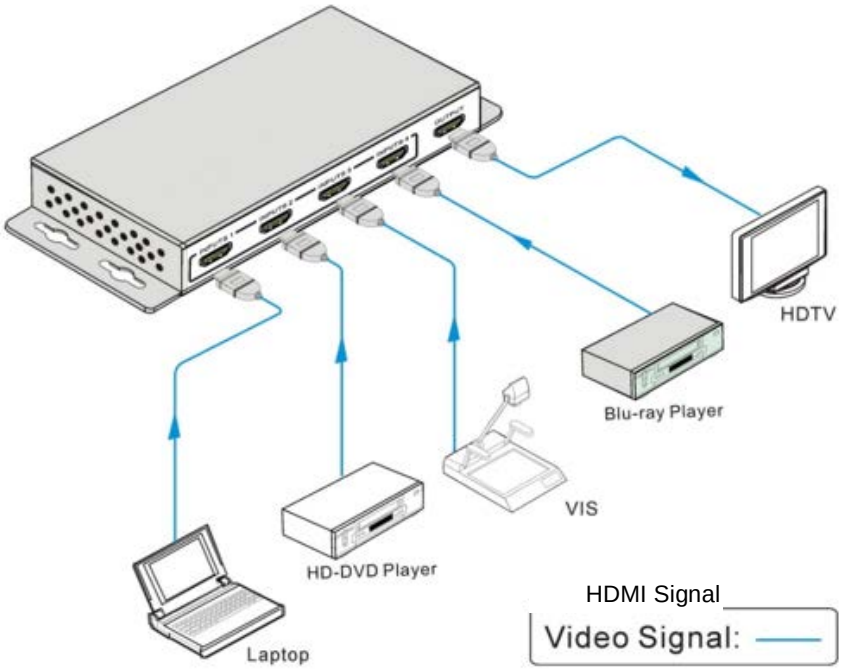
   Pin 2: Connects to the 5 pin of the male 9-pin connector (Gnd).

   Pin 3: Connects to the 3 pin of the male 9-pin connector (Rx).

2. Install the serial driver on the computer, if needed.
3. Once properly connected, you can control the 4x1 HDMI selection switch by sending RS232 command codes.

System diagram

Figure 3: System diagram



Auto-switching function

The 4x1 HDMI selection switch comes with an auto-switching function. The switch continually checks for an input signal. Once detected, it automatically switches. Additionally, it can be controlled from the front panel, IR remote, or RS232 integration.

The auto-switching mode follows the principles listed below.

General switching principle

When there is no new source device connected to the input port, the 4x1 HDMI selection switcher detects the input ports one by one and from input 1 to input 4. Input 1 has the highest priority, and the input 4 has the lowest. This means that if input 1 is available, the 4x1 HDMI selection switcher will choose input 1. If not, it will choose the next input available for output.

New input principle

When detecting a new input signal, the 4x1 HDMI selection switch switches to the new signal automatically. For example, if the 4x1 HDMI selection switch is displaying a signal from input 3, it will switch to input 4 when you connect a new source to this input.

Power rebooting principle

When rebooting, the 4x1 HDMI selection switcher remembers its last display and switching mode by using its power fail memory function. However, the 4x1 HDMI selection switch will detect the HDMI input signal again with priority from input 1 to input 4 once it can no longer detect the last input. This can occur if you remove the last displaying signal while the switch is powered off.

Signal removing principle

When the current display signal is removed, the 4x1 HDMI selection switch selects the HDMI input signal with the highest priority (Input 1 to input 4).

Examples

- Connect input 2 and input 4 to source devices. Press and hold the front key **INPUT 1** for three seconds. The LED indicator **Auto-SW** illuminates. The 4x1 HDMI selection switch starts running in auto-switching mode.
- The 4x1 HDMI selection switch detects the signal from input 1 to input 4 one by one. When it detects that input 1 is no longer available, it then looks to detect input 2. If it detects that input 2 has a higher priority and is available, it will select input 2 for output. The LED indicator of **INPUT 2** on the front panel will illuminate.
- Connect input 3 with a source device. The 4x1 HDMI selection switch chooses input 3 for output, since this is a new source.
- Remove the source device from input 3. The 4x1 HDMI selection switch again detects from input 1 to input 4. When it detects that input 2 has the highest priority and is available, it again chooses input 2 for output.
- Remove power from the 4x1 HDMI selection switch, and then reboot. As the 4x1 HDMI selection switcher goes into auto-switching mode, it chooses input 2 for output.

Auto-switching mode and manual-switching mode can be set by pressing the input 1 button, or by entering an RS232 command. Auto-switching mode is the factory default. The operations are listed below.

Button control

Pressing **INPUT 1** for three seconds toggles the switch between auto-switching mode and manual-switching mode. The Auto-SW LED designates which mode it is currently in.

RS232 control

Sending the RS232 command “602%” sets the switch to Manual mode and turns off the Auto-SW LED. Sending the RS232 command “601%” sets the switch to Auto mode and the Auto-SW LED turns on.

Panel drawing

Figure 4: Top view

Figure 5: Front view

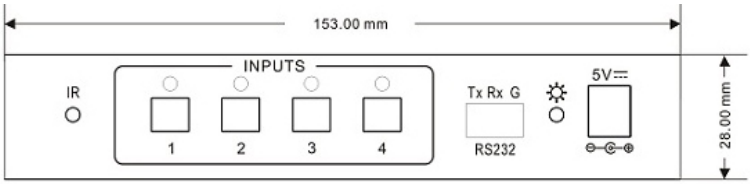
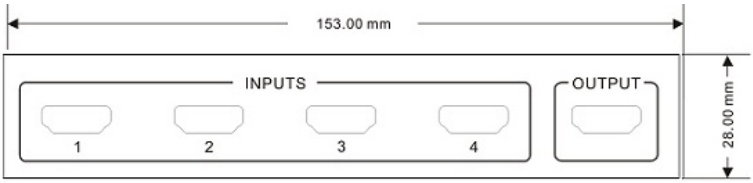


Figure 6: Rear view



Communication protocol and command codes

Communication protocol: RS232 communication protocol

Baud rate: 9600 Data bit: 8 Stop bit: 1 Parity bit: none

Table 2: RS232 command types and codes

Command	Function Description	Feedback Code
1B1.	Switches HDMI from input 1 to the output	AV: 1 -> 1
2B1.	Switching HDMI from input 2 to the output	AV: 2 -> 1
3B1.	Switching HDMI from input 3 to the output	AV: 3 -> 1
4B1.	Switching HDMI from input 4 to the output	AV: 4 -> 1
0B0.	Turns off the output	MUTE
0B1.	Turns on the output	UNMUTE
600%	Returns the current state of the switch	AV:1 -> 1
601%	Puts the switch into Auto Switching mode	Auto Switch
602%	Puts the switch into Manual Switching mode	Manual Switch

Troubleshooting and maintenance

- If the POWER indicator does not work, ensure the power supply is connected properly. Check to be sure that a circuit breaker has not tripped and that power is available. If power is available and the splitter will not power on, contact Customer Service for assistance.
- No image on display.
    - Ensure that the display device has been set to the correct input.
    - Ensure that the HDMI cables used for both the input source and the output displays are properly connected and are working. Test the HDMI cables directly from a source to display and ensure their operation.
    - Ensure proper grounding of the power supply.
- If the switch fails to respond to commands from the RS232, IR, or the front panel, contact Customer Service.

Safety operation

To guarantee the reliable operation of the equipment and safety of the staff, please follow the procedures listed below.

- The system must be grounded properly. Do not use two blades plugs. Ensure the alternating power supply ranges from 100 V to 240 V and from 50 Hz to 60 Hz.
- Do not locate the device in a place that is abnormally hot or cold or does not have proper temperature control and ventilation.
- The device generates heat when running. Its environment should be well ventilated to prevent damage caused by overheating.
- Disconnect power in humid weather, or when left unused for long periods.
- Before making or removing any connections to the device, ensure that the power supply has been disconnected.
- Do not attempt to open the equipment enclosure. Do not attempt any repairs. There are no user-serviceable parts inside. Any attempt to open the equipment will result in a complete void of any warranty and may result in serious injury or death.
- Do not splash any chemical substances or liquids on or around the equipment.

After-sales service

- If there appears to be problems when running the device, refer to the “Troubleshooting and maintenance” section in this manual. Return shipping costs are not covered by this warranty.
- You can contact Customer Support at claresupport@clarecontrols.com. Please be ready to provide the following information.
    - Product model number, version and serial number.
    - Detailed description of the trouble issues.
    - Description of all connections and 3rd party equipment being used.
- We offer this product with a three-year warranty, which starts from the first day you purchase this product.
- If, during the warranty period, the unit cannot be repaired, a suitable replacement will be issued. Replacement units will be comparable to the original. However, due to potential design changes over time, replacement units may not be identical to the unit replaced.
- Items not covered by this warranty.
    - Damage caused due to incorrect usage and/or connections.
    - Damage caused due to installation by person(s) not adequately trained in the installation of this equipment.
    - Any attempt to open this unit and access internal components shall immediately void this warranty.
    - Damage caused by any physical force (dropping the unit or dropping an object upon the unit, etc.).
    - Damage caused by voltage/cycle fluctuations outside acceptable range.
    - Damage caused by over-current, voltage spikes or lightning damage due to inadequate surge protection.
    - A valid invoice of purchase via an authorized dealer shall be required for any warranty coverage.